Course Plan

L. No.	Topics
L0	Click or tap here to enter text.
L1	Introduction to course; What is an Algorithm?
L2	Fundamentals of Algorithmic Problem Solving, Important Problem Types
L3	Fundamental Data Structures, Analysis Framework
L4	Tutorial-1 : Examples on Data structure, Asymptotic notations
L5	Asymptotic Notations and Basic Efficiency Classes
L6	Mathematical Analysis of Non-recursive Algorithms and Recursive Algorithms
L7	Selection Sort and Bubble Sort
L8	Tutorial-2 : Example on Non-recursive, Recursive Algorithms and recurrence relation solution
L9	Sequential Search, Brute-Force String Matching
L10	Exhaustive Search

L11	Depth First Search(DFS), Breadth First Search(BFS)
L12	Tutorial-3 : Examples on Exhaustive Search DFS and BFS
L13	Insertion Sort
L14	Topological Sorting
L15	Binary Search
L16	Tutorial-4 : Examples on Binary Search Insertion sort, topological sorting
L17	Merge Sort
L18	Quick Sort
L19	Binary tree traversals and related properties, Multiplication of large integers
L20	Tutorial-5 : Examples on Merge Sort, Quick Sort, Multiplication of large integers
L21	Stassen's Matrix Multiplication
L22	Presorting, Balanced Search Trees – AVL trees
L23	Balanced Search Trees – 2-3 trees
L24	Tutorial-6 Examples on AVL tree, 2-3 tree
L25	Heaps and Heapsort
L26	Problem Reduction, Sorting by Counting
L27	Input Enhancement in String Matching –Horspool algorithm
L28	Tutorial-7 : Examples on Heaps and Heapsort , Horspool algorithm
L29	Boyer-Moore Algorithm
L30	Hashing
L31	Computing a Binomial Coefficient, Warshall's algorithm
L32	Tutorial-8 : Examples on Boyer-Moore Algorithm, Hashing, Warshall's algorithm
L33	Floyd's Algorithm
L34	Knapsack Problem Bottom-up
L35	Knapsack-Memory Functions
L36	Tutorial-9 : Examples on Floyd's Algorithm, Knapsack Problem Bottom-up & Memory Functions
L37	Prim's Algorithm
L38	Kruskal's Algorithm
L39	Dijkstra's Algorithm

L40	Tutorial-10 : Examples on Prim's, Kruskal's & Dijkstra's Algorithm
L41	Huffman Trees
L42	Backtracking: n – Queen's problem
L43	Backtracking: Hamiltonian Circuit Problem, Subset-Sum Problem
L44	Tutorial-11 : Examples on Huffman Trees, Backtracking
L45	Branch-and-Bound: Assignment Problem, Branch-and-Bound: Knapsack Problem
L46	Traveling Salesperson
L47	P, NP and NP Complete Problems : Definition
L48	Tutorial-12 : Examples on Branch-and-Bound , P, NP problems

References:

1. Anany Levitin, "Introduction to the Design and Analysis of Algorithms", 3rd Edition, Pearson Education, India, 2011.
2. Ellis Horowitz and Sartaj Sahni, "Computer Algorithms/C++", 2nd Edition, University Press, India, 2007.
3. Thomas H. Cormen, Charles E. Leiserson, Ronal L, Rivest, Clifford Stein, "Introduction to Algorithms", 2nd Edition, PHI, India, 2006.